

⬆⬇⬅➡ The Boston Computer Society

SINCLAIR-TIMEX USER GROUP NEWSLETTER

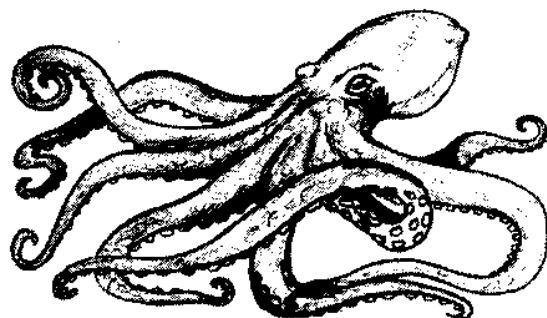
Volume 2, Issue 6

June 1983

This newsletter is produced to inform group members of the agenda and logistics for future meetings, as well as to recap and amplify the information provided at the last meeting. It also provides a forum for members and interested parties to communicate what they have learned or developed relating to Sinclair and Timex computer products. Meetings are open to the public; however, attendees are encouraged to join the Boston Computer Society (BCS). This newsletter is free to members. Back issues are one dollar each.

USER GROUP MEETING

Date: Wednesday, June 15, 1983
Time: 7:00 p.m.
Place: Large Science Auditorium
UMass, Harbor Campus
(Directions on last page)



At the June meeting, Dave Miller will demonstrate and explain QSAVE and FASTLOAD--programs which are available from Gladstone. In addition, Bill Russell, who runs a user group in central Pennsylvania, and edits the Synapse newsletter, will speak. The topic is his "Winky Board" and other new products, including a method for creating high resolution 3-D pictures on the Timex printer. Bill will have Winky Boards, a device to help loading and saving programs from tape, available to members at the meeting at a discount. They normally retail for \$24 assembled and \$18 for the kit.

We will break into groups to discuss topics of interest. Tentatively, an advanced and a beginner's group are planned.

If you have items to discuss at a future meeting or suggestions for presentations, contact Sue or Cliff.

HERALDING THE MACHINE LANGUAGE SUBGROUP

Robert Heath has volunteered to organize a machine language special interest subgroup. At the regular meetings, we strive to balance presentations to cover many areas and levels of expertise. The subgroup provides an opportunity to focus on machine language. In addition, it gives enthusiasts a chance to meet more frequently than once a month. The first meeting is tentatively planned for July 6th at ITEK Optical Systems in Lexington. For details contact Robert during the day at (617) 276-2424.

HIGHLIGHTS OF THE MAY MEETING

Sue Mahoney surprised us this month by bringing a prototype of the long-rumored but just announced TS-1500. The 9 1/8 by 5 3/8 by 1 3/4 inch silver box is an improved version of the TS-1000. It has moveable keys, 16 K of RAM, better filtering to make tape loading and saving more reliable, and some ROM improvements (see page 10). You will also be able to plug your 16 K RAM pack into it to get 32 K. Sue said the TS-1500 will list for \$79.95 and will be shipped to distributors in July. The TS-1000 will continue to be sold at its lower price. The most marked improvement we saw was in the TS-1500 keyboard, which employs the same conductive rubber technology as the Sinclair Spectrum, but doesn't have the Spectrum keyboard's "squashy" feel. In addition, none of the screws holding the box together are under the footpads.

John Kemeny described the Timex/Sinclair User Magazine group discount, which some people did take advantage of--sorry, its expired by now. He also passed on a request from Brady Publishing for volunteers to review manuscripts and proposals for computer related books. There is a small honorarium. Many people volunteered. John also stressed the need for volunteers to do user group work. (New members are particularly encouraged to get involved. Job descriptions are available if you're interested.)

Beth Elliott described the latest additions to the library. She said the original library fund (which was a donation from Maggie Bruzelius of Sinclair Research) is pretty much exhausted. Beth is looking for volunteers to solicit publisher contributions. She noted that Reston has already been very generous with us. Beth, who works at Sinclair Research, also announced that Sinclair has available, for bulk purchase, power supplies and transfer switches (those television antenna game boxes).

Jack Hodgson, our publisher, briefly discussed the evolving advertising policy: (1) to accept ads only for computer-related products and services, (2) to devote at most 25 percent of the newsletter to ads, and (3) to limit ads to 1/4 page to give more advertisers a chance. Jack is also interested in the group putting together a scrapbook of clippings about the Sinclair-Timex and related products. Send your contributions to Jack.

Dan Roy, our main speaker, presented a prototype of the COLORSIN81, a color add-on he designed. COLORSIN81 is a peripheral to the TS-1000 which gives it functions similar to the Spectrum. Due to the unavailability of the proper RF modulator, Dan was unable to demonstrate the 15 colors, 32 sprites, and high resolution aspects of his system. We did hear the three independent sound generators, each of which has a range of ten octaves. They were loud enough so that some of us are still hearing them! A 2 K PROM, which maps into the 12 to 14 K address space, implements 17 new Basic commands, such as SOUNDON. The system also supports two potentiometer type joysticks and a six-slot motherboard for expansion. An article on Dan's system, complete with schematics and construction tips, will appear in the July/August issue of Sync magazine. Currently, Dan is negotiating with a manufacturer to bring out a product. The price of a kit would be about \$160. Dan has offered to host a kit building session, if there is interest.

Dan also demonstrated the CAI/Exatron stringy floppy, a continuous loop tape system which allows for rapid saving and loading of programs. At 11000 baud, it can save a 16 K program in less than 25 seconds. The special "skinny" tape comes in a cartridge about 1 inch by 2 inches, and can store eight programs. A 2 K PROM mapped in the 10 to 12 K region interacts with the user through a menu. The menu options are: Save, Load, Certify (i.e., initialize the tape), Basic, and Drive (two drives may be connected

HIGHLIGHTS -- Continued

simultaneously). Dan says a useful feature is the ability to "chain" programs. That is, one program can call another (on tape) without user intervention. Dan likes his Exatron and considers it his most valuable peripheral. The only drawback he has found is the system's inability to copy software which is self-running (the menu which comes up after a load prevents self-running programs). The Exatron costs \$119.95 and may be ordered from CAI Instruments in Sanford, Michigan.

There was also some discussion about the incompatibility between Memotech's Memopak memories and the new Timex printer. Memotech acknowledges that some of their 32 K and 64 K memories are incompatible, but they don't yet know what the problem is.

WHY USE MACHINE CODE? by Dave Wood

Reason number 1 (with apologies to H&R Block): speed. The BASIC on the Sinclair-Timex computer is an interpreted language and, therefore, relatively slow when compared to the execution speed attainable by using the underlying processor. To do a simple comparison, try the programs in figures 1 and 2. Run them in SLOW mode to observe the difference.

```
200 PRINT "*";  
210 GOTO 200
```

Figure 1

```
10 REM Y*NOT /CLEAR  
20 RAND USR 16514
```

Figure 2

```
LD A, 17h  
LOOP RST 10h  
JR LOOP
```

Figure 3

Figure 3 is the machine language program stored in the REM in line 10 of figure 2. To enter the REM statement, type in: 10 REM Y*NOT / THEN CLEAR then use the backspace cursor (shift-5) and DELETE key (shift-0) to delete the THEN token. Make sure you enter the tokens NOT and CLEAR.

A QUICK WAY TO DISPATCH THE EDIT LINE

Did you ever notice that in department stores which showcase the TS-1000, the edit line is always filled with umpteen lines of garbage? You don't have to do scores of DELETES to get rid of it. Just press EDIT (shift-1) followed by ENTER.

RANDOM POKES

The RAND command sets the 2-byte system variable SEED, which is located at addresses 16434 and 16435. The variable is set to the expression following RAND (except RAND 0--what happens then?). Unlike functions, the expression does not require enclosing parentheses. We tell you this because to do USR calls many people use: RAND USR address. If you don't want the "side-effect" of changing the random number seed in USR calls, try: IF USR address THEN.

If you are not using the random number seed, there is a simple way to convert a floating-point number N into a 2-byte integer. Replace the two statements, POKE 16435, N/256 and POKE 16434, N-256*INT (N/256), by RAND N.

ROM BUG #3 REVISITED

Last month's ROM Bug #3, which causes numbers with leading zeros (i.e., 0.01 thru 0.00001) to be LPRINTed incorrectly, was independently discovered by Robert L. Carter. He sent Timex the program in figure 1 to illustrate the problem. To make the program do what it should, add line 25 LET A\$=STR\$ A and replace the variable A in line 40 with A\$. Timex replied that they were able to correct the ROM code for the next generation of Timex computers.

In the meantime, Mike Wagner of Wankesha Wisconsin sent a letter to Syntax (Volume 4, Number 5; May 1983) describing the problem in the ROM. The routine to output leading zeros of a floating point number with negative exponent is shown in figure 2. Mike's solution is to change the destination of the DJNZ from LOOP to ALT, i.e., change ROM address 016BC from FD to FB hex. RST 10 outputs the character in the A register to either the screen or the printer. The problem is that the LPRINT routine at 0851 hex forgets to restore the A register before returning. So what is in the A register is the low byte of the address of the current position of the print buffer (anything from 3C to 5C hex). Adding the required LD C,A instruction to LPRINT would mean moving every byte in the ROM that follows the change. This would change ROM routine entry addresses, not required by Mike's suggestion. It will be interesting to see how Timex has solved the problem.

```
20 LET A=0.00001
30 FOR I=0 TO 35      ALT  LD  A, ICh
40 LPRINT TAB I;A     LOOP  RST  10
50 NEXT I             DJNZ  LOOP
```

Figure 1

```
10 INPUT B
15 INPUT T
20 CLS
30 LPRINT
40 LPRINT TAB T,B;
50 FOR I=16444 TO 16444+32
60 PRINT I;" ";PEEK I,
70 NEXT I
80 GOTO 10
```

Figure 3

In case you don't have a Timex printer, the program in figure 3 can be used to verify the bug. Input a number between 0.01 and 0.00001 and a number for TAB spacing. The screen shows the bytes stored in the print buffer awaiting printing. The semicolon in line 40 is important because it keeps the result in the print buffer. Without the semicolon, the result would be sent to the printer and the buffer cleared. The numbers you will see represent the bytes for the decimal point (27), the first zero (28), the bytes in error, and the rest of the number (29 for a one, for example).

ROM BUG #4

In the May issue of Syntax, Dean A. Cuadra, of Los Angeles California, reported that it is possible to crash the system without using POKES with the program:

```
10 GOSUB 20
20 GOTO 10
```

Executing GOSUB pushes a return "address" (actually a line number) onto the computer's stack. To remove this entry requires the execution of a RETURN command. Obviously, executing too many GOSUBs without RETURNS will use up all the memory--the computer stops with error report 4. So where's the bug? The

bug is that there is no effective way to clear the stack without executing a NEW or pulling the plug. Using RETURN doesn't work because once you execute it you lose control--the computer gets the address of the next line from the stack. The logical command to clear the stack is CLEAR, but it doesn't. CLEAR just deletes the variables. Just for fun, let's see out how many times we can push the GOSUB stack. Figure 1 shows a straightforward attempt. Since the program stops on an out of memory error, we won't have any room in the display file to PRINT A, the answer. Therefore we put in line 10 to take up space. After the program stops, we can delete line 10, PRINT A, and voila! Well, not quite voila. You see, when the stack overflows, it overflows into the variables area, corrupting the value of A. We'll have to put the result someplace other than a variable. Figure 2 is a program which puts the result in the random number seed--an application of the hint on page 3. Also, instead of the REM statement taking up space, we used a dummy variable A\$. After RUNNING the program, use CLEAR to buy back space. Then type GOTO 70 to print the result. The answer depends on how much memory you have. Although in general we can't use RETURN to clear the stack, in this case we can. Change line 30 from GOSUB 50 to RETURN. Now RUN the program again. It should stop with error report 7. Type a GOTO 70. What do you find?

```

10 REM OVERFLOW THE STACK
20 LET A=1
30 GOSUB 50
50 LET A=A+1
60 GOTO 30

```

Figure 1

```

10 DIM A$(50)
20 RAND 1
30 GOSUB 50
50 RAND 1+PEEK 16434+256*PEEK 16435
60 GOTO 30
70 PRINT PEEK 16434+256*PEEK 16435

```

Figure 2

TIMEX 1000

BUSINESS

Budgeting	\$9.95
Inventory Control	\$9.95
Financial Analyzer	\$9.95
Stock Analyzer	\$9.95
Critical Path Analyzer ..	12.95
Bookkeeping	14.95

GAMES

Leap Frog	\$9.95
Star Voyage	\$9.95
Fungaloids	\$9.95
Invaders	\$9.95
Chess	\$9.95
Snakebite	\$9.95
Packman	\$9.95

UTILITY

Assembler	\$9.95
Disassembler	\$9.95
Compiler	\$9.95
Graph	\$9.95

AND MANY MORE EXCITING PROGRAMS

CALL FOR FREE CATALOG

Shipping extra. No tax out of state.

DISCOUNT SOFTWARE, INC.

RCU PO BOX 2530, New York, NY 10185
Tel: (212) 486-0980

TURTLEWORKS COMPUTER CAMPS

We use LOGO to create a friendly environment in which young people learn not only how computers work, but encounter and play with important ideas about language, mathematics and logic.

- INDIVIDUALIZED PROGRAMS IN LOGO
- 3-1/2 HOUR DAILY SESSIONS
- GRAPHICS AND LANGUAGE EXPERTISE
- INCREASED INDIVIDUAL AND COOPERATIVE PROBLEM-SOLVING SKILLS
- CREATIVE EXPERIENCE OF LEARNING AND PLAY
- CONVENIENT BACK BAY LOCATION

Week-long sessions begin July

11.

Call or write for brochure & application.

TURTLEWORKS
10 Follen Street
Boston, MA 02116
424-1978



ORGANIZER APPLICATION by Jack Hodgson

My roommate, Mark collects "Top 40" singles. He owns over 3500 45 rpm records. Some were hits as long ago as the 1930s, but most are from the last 20 years. In addition to maintaining this collection for his own enjoyment, he uses it to earn money as a dance deejay. He, his sound system, and his 3500 plus records go to dances, parties, and other assorted functions.

Over the years, Mark has created a file of his collection using 4 by 6 inch index cards (figure 1). These cards contain, in addition to the title of the record and the artist's name, information about when the record was released, when it entered the top 100, when it dropped from the top 100, the highest position it reached, and cross references of performers who were with other groups. Mark keeps this file in alphabetical order by artist's name. The file occupies two and one-half 15-inch file drawers.

A few months ago Mark created a data base of his collection using the Organizer program from Timex. Although it would be valuable to be able to update and print out the file more easily, his main goal was to be able to search through the date and top 100 position information. Often, when he was playing records at a party, guests would make a request like this: "We graduated school in 1972, can you play some songs that were hits that year." In the past, he dealt with these requests from his own knowledge of music. And although his knowledge is amazingly comprehensive, it is not totally complete.

In creating the file, Mark realized right away that it was going to be difficult, if not impossible, to code 3500 records into 10,000 bytes of storage space (DIM F\$(9999)). He dealt with this problem in the time honored fashion of deciding to think about it later. In the meantime, he resigned himself to storing the information in more than one tape cassette file.

The next question was how to format the file. He set up the screen rather straightforwardly (figure 2). The first field contains the artist's name, the second is a cross reference, when needed, to other groups. Subsequent fields alternate between one with a song title and one containing the year and position information. On his index cards, information is simply numbers separated by markers. He knew from memory which column contained which piece of information. To make data base searches possible, he added letter postscripts to the numbers. Without the letter, a search on 65 could be interpreted as "entered chart at number 65," when it really meant "released in 1965." In this data base, 65N means the former and 65Y the latter.

As it stands, the program does the job expected of it. It can search for and find entries by song title, top position, year released, etc. It can reorder the file by any field and it can easily be updated. The main problem now is that, in order to do a complete search, the program must be loaded several times. Each load contains part of the data base. Mark is currently looking for ways around this problem.

Here are a few of the solutions under consideration. Reduce the artist's name entry to one or two bytes, which can be looked up in an external index. Encode common words such as "love," "you," "him," and "her" a single byte which is decoded and printed correctly on the display. Mark is also looking into the data compression techniques reported in previous issues of this newsletter. The last two solutions will, of course, require changes to the Organizer program. But then it's not written in stone. (Boy! If it were would it be slow then!)

ORGANIZER APPLICATION -- Continued

Perhaps the ultimate solution to these problems is to add hardware. A 64 K RAM pack, a stringy floppy, or a full fledged disk drive would do the job easily. But I'd like to think that the first way to solve any problem is through efficient programming.

So there's Mark's Organizer application. It's not perfect but it beats the hell out of those index cards. I'd love to hear from anyone who has any ideas about this application.

COMMANDS ARE: ENTER ALTER INFORM
FORWARD BACK RESET ORDER SELECT
QUIT LIST PRINT COPY DELETE

ANKA, PAUL

SEE ALSO:

45 (YOU'RE) HAVING MY BABY
74Y/30N/01P/40F/25
45 ONE MAN WOMAN/ONE WOMAN MAN
74Y/48N/07P/58F/28
45 I DON'T LIKE TO SLEEP ALONE
75Y/13N/08P/23F/22
45 TIMES OF YOUR LIFE
75Y/48N/07P/59F/23
45 (I BELIEVE) THERE'S NOTHING
STRONGER THAN OUR LOVE
75Y/33N/15P/40F/15

45 IT'S TIME TO CRY
XXXX

74Y = Released in 1974
30N = Entered Chart Number 30
01P = Top Position Number 1
40F = Left Chart 40th Week of Year
25 = On Chart 25 Weeks

figure 2

ANKA

ANKA, Paul

45 (YOU'RE) HAVING MY BABY / papa
#1 A.T. 40 8/24; 3/74; 9/7/74 74-30-01-40-25 Box C

45 ONE MAN WOMAN / ONE WOMAN MAN // let me get to know
74-48-07-58-28 Box E you

45 I DON'T LIKE TO SLEEP ALONE / how can anything be
75-13-08-23-22 Box F beautiful-after you

45 IT'S TIME TO CRY / something has changed me

45 TIMES OF YOUR LIFE / water runs deep
75-48-08-59-23 Box H

45 (I BELIEVE) THERE'S NOTHING STRONGER THAN OUR LOVE/
today I became a fool
75-33-15-40-15 Box G

figure 1

KNOWING LEFT FROM RIGHT

What is the order of evaluation for expressions in the Sinclair-Timex? This question, which came up at the last meeting, is not as complex as it sounds. $4+(2*3)$ is 10, and $(4+2)*3$ is 18, obviously. But what is $4+2*3$? The answer is 18. This is because there is a precedence between the operations + and * which gives priority to *. That is, if there are no parentheses, multiplication is done before addition. What about $5*3/2$? According to the manual, expressions involving operators which have the same priority, like * and /, are evaluated left to right. That is, as if the expression were $(5*3)/2$. We can see this by examining the part of the ROM called the parser. The problem is, can we convince ourselves of left to right evaluation by looking at results of BASIC expressions?

PRINTING $(5*3)/2$ and $5*(3/2)$ won't tell us anything, since both results are 7.5. When an operation, call it @, is such that $(a@b)@c$ is equal to $a@(b@c)$, the operation is called associative. In our computer, operations with the same priority are associative with respect to the floating-point numbers used by the computer. But all is not lost. Allan Cohen, at the last meeting, came up with an ingenious solution using error messages. First, LET $X=2**126$, close to the largest number that can be represented as a floating point number. Now, look at the expression $2*X/2$. A left to right evaluation, $(2*X)/2$, would yield an overflow error, while $2*(X/2)$ would print a valid number. What happens when you PRINT $2*X/2$? As a variation on this theme, try PRINT $2/0*G$, where 2 is divided by zero and G is undefined. The expression $(2/0)*G$ will halt with error 6 for division by zero, while $2/(0*G)$ will halt with error 2 for undefined variable. Is there a way to distinguish left from right without using error messages? Send us your comments.



IS GLARE GETTING YOU?

If you didn't attend the February meeting, you may have missed this suggestion from Will Stackman. To reduce eye strain when using the computer, OSHA recommends the use of a yellow or amber monitor. In Europe, such monitors are very popular; however, due to their cost, they are not too popular in the United States. To convert a black and white monitor or television to an inexpensive yellow monitor, cover the screen with a sheet of theatrical color medium (gel), such as Roscolene. This can be purchased from a theater supply store. A 22 by 28 inch sheet costs about \$3. Will says he prefers a light amber color. It can be taped to the set and removed for cleaning with a soft dust cloth. You could even use an anti-static spray for cleaning the dust from the film.

The Boston Computer Society helps make sense out of personal computers. If you're interested in computers for home, business or education, come to The BCS for objective information and support. The BCS is the largest nonprofit personal computer association in the United States; our goal is not to promote any particular brand of computer, but to help computer users and people who just want to know what a computer could do for them.

Sign me up for these user/interest groups:

- ☐ Apple/Boston (Apple)
- ☐ Atari User Group
- ☐ Business User Group
- ☐ Consultants & Entrepreneurs Interest Group
- ☐ Database User Group
- ☐ Displaywriter User Group
- ☐ Educational Resource Exchange
- ☐ 80/Boston (TRS-80)
- ☐ Family Home User Group
- ☐ Logo User Group
- ☐ IBM User Group
- ☐ North Star User Group
- ☐ Osborne User Group
- ☐ OSI/Boston (Ohio Scientific)
- ☐ Pascal User Group
- ☐ PET/CBM/VIC User Group
- ☐ Robotics Interest Group
- ☒ Sinclair/Timex User Group
- ☐ Telecommunications User Group

SERIOUS PROGRAMMERS

"MUST-HAVE" UTILITIES
For ZX-81 and T/S 1000 Computers

FILE*SYS \$10

Read/Write Cassette Data Tape Files
(fast, flexible, reliable)

FILE*BASIC \$15

Save/Merge/Erase BASIC Segments
(includes FILE*SYS functions)

FILE*VARS \$5

Save/Restore Strings & Arrays
(requires FILE*SYS or FILE*BASIC)

BASIC*OLAY \$10

Overlay/Copy BASIC Segments
(permits full use of 64K RAM)

Simple user interface via USR function

Well-documented user manuals

Available on tape cassette in relocatable machine lang.

SASE for info

Check or MO delivers now


SiriusWare

6 Turning Mill Road
Lexington, MA 02173

IT'S HERE!!

The keyboard you have
been waiting for!

A LARGE 60 KEY TACTILE FEEL KEYBOARD (MEASURES 10" x 4") THAT PLUGS INTO THE SAME CONNECTORS AS EXISTING KEYBOARD ON YOUR ZX81 OR TIMEX SINCLAIR 1000. IT HAS ALL SILKSCREENED LEGENDS IN 3 COLORS ON THE BASE; MOLDED LEGENDS & GRAPHICS ON KEY TOPS; 8 AUTOMATIC SHIFT KEYS (NO SHIFTING REQUIRED) FOR EDIT, DELETE, SINGLE & DOUBLE QUOTES, COLON, SEMI-COLON, FUNCTION & STOP; 5" SPACE BAR; 2 SHIFT KEYS; NUMERIC KEY PAD.

ONLY \$84.95

MASS. RESIDENTS ADD 5% SALES TAX
SHIPPING & HANDLING \$4.00/UNIT

QUANTITY DISCOUNTS. WE
WILL ACCEPT MC/VISA. PLEASE INCLUDE #S, EXP.
DATE AND SIGNATURE. FOR MORE INFORMATION
SEND SASE. SEND INQUIRIES, CHECK OR MONEY
ORDER TO:

E-Z KEY

SUITE 75

**711 SOUTHERN ARTERY
QUINCY, MA 02169**

UPDATE ON THE LIBRARY by Beth Elliott

The latest library additions are Learning Timex Sinclair BASIC by David A. Lien, The Timex Personal Computer Made Simple by Joe Campbell, and The Best of Sync edited by Paul Grosjean. In addition, we have nine other books, 11 programs, a user groups' newsletter collection, a Syntax magazine collection (nearly complete), and assorted advertisements from software and peripheral companies.

Our current policy toward borrowing copyrighted software is: (1) only one tape per borrower, and (2) the borrower must agree to present the software to the group and/or write an evaluation of the software for the newsletter.

UPDATE ON THE BCS BULLETIN BOARD

Ken Pugh has constructed and is maintaining a bulletin board for the BCS. The bulletin board offers screens of information about the BCS and its user groups. It also has advertising and the capability to leave messages. Access to the bulletin board is free and the size of the screens are compatible with the display on our computer. Currently, the Sinclair-Timex User Group maintains four screens of information. These are to describe when and where we meet, announce the activities for the next two meetings, and identify additional sources of information. Currently, Cliff Danielson is maintaining these screens. Temporary screens are available, following the user group screens, if you want to leave a message for other Sinclair-Timex users. A 300 baud modem is needed to access the bulletin board. The telephone number is (617) 969-9660. Use an 8-bit code, no parity, and one stop bit.

THE TS-1500

As you could read in the highlights, the TS-1500 is an improved version of the TS-1000 in TS-2000 packaging. With a nice keyboard, 16 K of RAM, and an \$80 list price, they should be in the stores by August--but they won't stay there very long. What do you do with your 16 K Ram pack? Just plug it into the TS-1500 edge connector (all the connectors are on the back, by the way) and run with 32 K. In order to accomplish this nice little feat, we figured Timex had to redesign the custom uncommitted logic array chip (ULA or mystery chip, as we call it). Indeed they did. Instead of a 40-pin bipolar chip, it will have a 68-pin CMOS chip! CMOS technology greatly reduces the power consumption, eliminating possible heating problems and allowing for far longer operating time from batteries. A new chip also allowed the ROM to be completely decoded to the bottom 8 K of memory.

Timex also announced that the TS-1500 will also feature solid-state cartridge software and 8-bit bank switching to give 64 megabytes of addressability--like the TS-2000 series (series?). Will it use the new Z800 chip when it becomes available? The only change to the bus will be the chip select line for the ROM.

The ROM will also be different. The changes will: fix ROM bug #3 (see article in this issue); modify the compare routines so that floating-point numbers like 13.0 are equal to 12.999999999999; add to the reboot routine at 03CA hex for tuning to the proper TV channel (no more switch on the bottom). None of these changes should affect the TS-1500's compatibility with the existing TS-1000 software base.

timex sinclair user

The NEW independent magazine for the ZX81, T/S1000

Guarantee

If ever you feel TIMEX SINCLAIR USER isn't helping you get the most from your computer, you may cancel your subscription and we will refund the value of all unmailed issues -- and you may still keep your Packrabbit!



Phone

★ 1-800-543-3000 ★
Operator 243

Have your VISA or MASTERCARD ready!

BONUS OFFER

Free "Packrabbit"
Retail value \$15.00

A good reason to order now! Receive a software program cassette of an exciting, new arcade game! "Packrabbit" is a regular \$15.00 retail value. Free with subscriptions for a limited time only.

Mail to: Subscriptions Timex Sinclair User 49 La Salle Ave., Buffalo, N.Y. 14214-1414

Please print

NAME _____

STREET _____

CITY _____

STATE _____ ZIP _____

Bill me ☐

MONEY ORDER ☐

Check ☐

VISA ☐

MASTERCARD ☐

Expires _____

Card # _____

Signature _____

One year

\$29.95

(12 issues)

BCS

Time

TimeWare Bookware

*Explorer's Guide to the ZX-81 and
Timex/Sinclair 1000*

Mike Lord

*Mastering Machine Code on Your
Timex/Sinclair 1000*

Toni Baker

*50 1K/2K Games for the Timex.
1000 & ZX-81*

Alastair Gourlay et al

The Timex/Sinclair Pocket Book

Trevor Toms

Making the Most of Your Timex

Tim Hartnell

49 Explosive Games for the Timex

Tim Hartnell

RESTON PUBLISHING COMPANY

11480 Sunset Hills Road
Reston, VA 22090

or call our toll-free number:

800-336-0338

and ask for TimeWare Marketing

INCREASE THE POWER OF YOUR TIMEX SINCLAIR 1000 with INTERCOMPUTER PACKAGES

We offer up to **20% DISCOUNT** for user Groups and Students on our Peripherals and Software in the areas of:

- Education
- Entertainment
- Utilities
- Home Management
- Programming Tools
- Word Processing

AND

- Memory Expansion
- RAMS
- Interface
- QSAVE-Quick Loading
- Printers
- Flexible Ribbon Connector
- High Resolution Graphics

AND MORE

NEW: Software on cartridges, Softbox, and Intercontroller

To order or for more information and free brochure, write or call Intercomputer, Inc. P.O. BOX 90, Prudential Center, Boston, MA 02199 Tel. (617) 437-1190

Coming soon: A full line of Software and Hardware for **Timex 2000** and other small computers.

ATT: Programmers, better royalties for your high quality programs

How will you take your SYNTAX/Syntax Quarterly?

The Combination—12 issues SYNTAX, 4 issues SQ	\$39
The Catch-up—SYNTAX Jan. 82-Dec. 83, SQ Nov. 82-Nov. 83 (5 issues), 1 binder	\$77
The Works —SYNTAX Nov. 80-Nov. 83, SQ Nov. 82-Nov. 83 (5 issues), 2 binders	\$97
12 issues of SYNTAX	\$29
4 issues of SQ, Syntax Quarterly	\$15
1 issue SQ ☐ Winter ☐ Spring ☐ Summer	\$ 4.95
1 Magazine binder to hold your SYNTAX or SQ	\$ 9

To order or request more info, call 617/456-3661. Or write SYNTAX/SQ, RD 2 Box 457, Harvard, MA 01451.

SYNTAX/Syntax Quarterly for Timex Sinclair computer users.

LISTING AND LLISTING WITHOUT LIST AND LLIST by Dave Wood

The following BASIC program was developed to get BASIC listings on a printer which cannot do LLIST, such as the Okidata printer in the May newsletter. The concept is to use the display file as a buffer between the encoded BASIC in the RAM area following address 16509 and the characters needed to print out. The screen is cleared. Then a program line is printed on the screen, one character at a time, till a line is complete. This line is then sent to the printer, one character at a time. The process stops when the next line starts with the ENTER token (118).

Another application of this routine is as a substitute for LIST. Replace line 9987 with GOTO 9976, and simply omit lines 9988 to 9999 and line 9973. It works just like LIST, but now when the screen is full, instead of typing LIST with a new line number, just enter CONTINUE. Try LISTING every other line, or the line numbers used by your program.

```

9973 LET A=32525
9974 LET C=16509
9975 CLS
9976 LET I=C
9977 IF PEEK I=118 THEN STOP
9978 PRINT 256*PEEK I+PEEK (I+1);
9979 LET N=PEEK (I+2)+256*PEEK (I+3)
9980 FOR K=I+4 TO I+N*2
9981 LET B=PEEK K
9982 IF B=126 THEN LET K=K+5
9983 IF B=126 THEN GOTO 9985
9984 PRINT CHR$ B;
9985 NEXT K
9986 LET C=K+1
9987 LET I=I+PEEK 16396+256*PEEK 16397
9988 LET N=PEEK 16398+256*PEEK 16399-I
9989 FOR K=I TO I+N
9990 LET P=PEEK K
9991 IF P=118 THEN GOTO 9994
9992 POKE 16506,P
9993 LET L=USR A
9994 NEXT K
9995 POKE 16506,13:
9996 LET L=USR A
9997 POKE 16506,10
9998 LET L=USR A
9999 GOTO 9975

```

FOR MORE INFORMATION

Sue Mahoney, Director of the Sinclair-Timex User Group
c/o The Boston Computer Society or call (203) 573-5816.

Jack Hodgson, Publisher
P.O. Box 526, Cambridge, MA 02238, (617) 354-7899

Cliff Danielson, Editor
14 Davis Road, Chelmsford, MA 01824, (617) 256-4638.

John Kemeny, Contributing Editor & User Group Correspondent
284 Great Road, Apt. D5, Acton, MA 01720.

Library Committee: Beth Elloitt, Sean O'Rahilly, and Bob Sanchez.

ADVERTISING INFORMATION

Computer Related Products and Services Only

Open Rate: \$40 per Quarter Page

For Rate Card and Discount Information Contact the Publisher

DIRECTIONS TO THE MEETING

The Sinclair-Timex User Group meets in the Large Science Auditorium (Room 8/2/009) of the University of Massachusetts of Boston, Harbor Campus. The Harbor Campus is only 3 miles from downtown Boston and easily accessible by public and private transportation. From the north or west, take the Southeast Expressway to Exit 17. Turn left onto Columbia Road. Enter the rotary and take the first right (Morrissey Boulevard). Bear right on the traffic island, following UMass/Boston sign. Turn left into the Campus. From the south, take Morrissey Boulevard northward to the campus. On the MBTA, take the Red Line (Ashmont Train) to Columbia Station. Transfer to the free University shuttlebus in the T parking lot.

 The Boston
Computer Society

Three Center Plaza
Boston, MA 02108
617-367-8080

Nonprofit
U.S. Postage
Paid
Permit 1138
Boston, MA